DOCUMENT RESUME

ED 339 307 HE 025 092

AUTHOR Healy, Patrick J.; Jellema, William W.
TITLE Financial Aid Effect on the Matriculation Decision. ASHE Annual Meeting Paper.
PUB DATE Nov 91
NOTE 39p.; Paper presented at the Annual Meeting of the Association for the Study of Higher Education (Boston, MA, October 31-November 3, 1991).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Admission (School); *College Choice; Higher Education; Paying for College; *Private Colleges; *Student Financial Aid
IDENTIFIERS *ASHE Annual Meeting

ABSTRACT

In order to examine the link between offering financial aid and a potential student's decision to attend a particular college, a case study of matriculation and financial aid offerings at a private, four-year liberal arts college in the northeast was undertaken. The study was prompted by a fourth straight year of significant decline in the college's number of entering students. The study focused on entering students for 1985 and 1986. In the course of these 2 years the college modified only one variable: a significant change in financial aid policy. T-tests on all subjects confirmed an acceptable level of homogeneity across the two pools. The 1985 group received awards averaging approximately 78 percent of their estimated need. The 1986 group received significantly higher levels of financial aid across the board and generally had 98 percent of their estimated need satisfied by their financial aid award in the form of institutional grants. Results indicated that the change in financial aid award sum and percent of estimated need for the 1986 group resulted in a significant increase in the rate of matriculation. Included are 3 tables and 15 references. (JB)

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Park Plaza Hotel & Towers in Boston, Massachusetts, October 31-November 3, 1991. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

"Financial Aid Effect on the Matriculation Decision"

Patrick J. Healy and William W. Jellema

Introduction

The need for increases in financial aid opportunities has been a much discussed and widely publicized issue in higher education for the past several years. During this time federal financial aid has been reduced drastically while the price differential between the public and private sectors of higher education has increased dramatically and the traditional pool of college age students has declined. In addition, there has been pressure to improve access to higher education and price plays a major role in restricting such improvement.

These factors have combined to threaten the future of our country's diverse and balanced system of higher education opportunities. The most significant enrollment pressure has been on the smaller, less well endowed, and less prestigious private institutions of higher education, a group that represents the vast majority of colleges in the private sector. A consequence of this situation has been for these colleges to try to use institutional financial aid to replace the reduced federal aid and to lessen the growing tuition gap between the public and private sectors. The primary goal of this strategy is to minimize the enrollment erosion that can be attributed solely to price.

In an effort to compete more favorably, many private

institutions have employed a wide range of marketing strategies, including the utilization of additional financial aid in order to "discount" their tuition. This increasing spiral of institutional commitment to financial aid is an effort to draw more, or at least no fewer, students from a declining pool of high school graduates. The financial viability of this approach is arguable and much more needs to be learned about the strategic use of financial aid. The amount of institutional financial aid is a pricing decision which must meet the objectives of both society and the institution. In an era when the high tuition rates of private higher education are widely questioned and there are far-flung demands for accountability, a means to measure the success of financial aid decisions must be established. Historically, the management of this function has been much more of an art than a science.

Financial aid is often one of the largest budget items of an institution, yet the ability to measure its effectiveness in more than general terms is usually absent. This lack of an outcome measure of financial aid is a significant problem in managing the finances of higher education. Although all institutions have some "formula" for distributing aid, few can present a quantitative analysis that demonstrably shows why that formula is more effective than some variation of it, or, indeed, than some other formula altogether. This study sought to provide information with which to assess the strategic use of financial aid when setting tuition levels and engaging in enrollment

planning.

The demand for higher education is based upon a number of human and economic factors largely beyond the immediate control of any institution of higher learning; but the competitive success of a given institution in meeting that demand is often a combination of price, perceived quality, brand loyalty or reputation, and the availability of similar alternatives. If price is the sole consideration, no private institution of higher education can compete with a similar and neighboring public institution. Since price is often a powerful consideration, significant price discounting seems required. Even then large amounts of financial aid usually do not eliminate this gap but merely reduce it to a more acceptable level. All too often, this discounting is done without any differential assessment of the results.

Reduced aid available from the federal and state governments, the declining pool of high school graduates, significant competition from the public sector (as well as within the private sector) and the feverish desire not to reduce enrollment have produced tremendous pressure on those making pricing and discount decisions. Boards of Trustees, presidents, finance, admissions, and financial aid officers, faced with an increasingly competitive marketplace, are called upon to conduct sophisticated enrollment planning, and to optimize their pricing actions. Admissions personnel, perhaps understandably, advocate increasing student financial aid in order to solve their short

term problems. Despairing presidents and Boards of Trustees often feel driven to clutch this strategy even as the net revenues of their institution continue to decline. Finance officers struggle with the consequences of decisions made without an understanding of whether and to what degree additional financial aid produces advantageous outcomes.

Pricing and Financial Aid

In instances where matriculation is a choice between public and private or between similarly competitive independent institutions, price is often a compelling determinant. A major consideration for all institutions, therefore, is the establishment of the relationship between tuition and financial aid. This decision should be made on a fully informed and quantitatively evaluated basis in order to assure a prudent and cost effective strategy. The use of financial aid to assist in enrollment management has social as well as financial implications. When used equitably, financial aid can significantly improve access to those otherwise unable to attend institutions of higher education. When used inequitably, limited college resources are wasted and neither the institution nor the prospective needy students benefit.

In effect, institutions need to make two major financial decisions regarding their price: (1) establish a fair market rate for tuition, in light of both quantitative and qualitative factors, and (2) determine the degree to which they are willing

to reduce this price through the use of institutional financial aid. The price (tuition) that institutions charge for their product (higher education) is a combination of their unique cost structure, local market conditions, regionally accessible alternative or substitute institutions, brand or product loyalty, and the availability of financial aid (price discount). When there was significantly more federal and state support for higher education, the burden for financial aid did not fall as heavily on the individual institution as it does presently.

Theoretically, if all choices of higher education were equal, rational consumers and their parents would select the lowest price. However, tuition rates at private institutions of higher education are not determined on a commodity basis wherein all units of production at all institutions are considered equal, but by an estimation of qualitative differences among institutions -- an estimation significantly influenced by the consumers' perception of the institution's relative position among other similar institutions. Therefore, the pricing decision is as much qualitative as it is quantitative. Most institutions, indeed, claim that quality is the basis for their price structure. Since the capacity to document -- or to challenge -- quality differences has not been developed, prestige sometimes seems to accrue to colleges and universities that charge more. This appears to explain why some very selective institutions can charge a significantly higher tuition than others and still attract many more candidates than there are

available spaces.

The gap between the tuition rates of public and private institutions has increased from a private college charge that was about three times the amount charged in the state sector in the early 1950's to a five fold factor in the 1980's.[1] This widening chasm creates a significant pricing problem for the smaller, less prestigious, institutions of private higher education.

The basis for establishing tuition in the private sector involves many factors that are different from those in the public sector. These factors include an appropriate "market rate" relative to similar private institutions, the institution's underlying cost structure, and the degree to which their development efforts have provided endowment fund earnings or annual levels of philanthropic support which can be used to offset the educational costs that would otherwise have to be paid from tuition revenues.

The reasons for giving discounts are many, such as scholarship, athletics, minority recruitment, and support to needy students; but what is fundamentally at stake is influencing the matriculation decision of students and their families by minimizing the cost to the consumer in comparison to the alternatives. To the extent that the alternatives are other private institutions, this is a fair game. To the extent that

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[1]Kent Halstead, Higher Education Tuition, (Washington, D.C.: Research Associates of Washington, 1989), 4.

the competing institutions are public institutions, it is extremely difficult and probably fiscally irresponsible for a private institution to attempt to compete solely on the basis of price. Many institutions, however, are faced with pursuing more generous financial aid policies or accepting decline, including possible demise.

Higher education, as frequently noted, is very labor intensive, and those whose livelihood is at risk create pressure to fix a price that will maximize enrollment even though this may result in a slow erosion of fiscal viability. This can be referred to as the "full employment" financial aid decision: an institution continually discounts its price in an effort to increase (or at least stabilize) enrollment in order to justify its staffing levels, even though the net tuition contribution margin to the institution is not increased.

Evaluating financial aid on an incremental basis -- that is, incremental revenue (the amount of income remaining net of financial aid) less incremental cost (the cost of educating and servicing the additional student) -- is extremely difficult. This evaluation is complicated further by the fact that at the time aid is being offered, the institution does not know which students will accept its offer or the level at which financial aid pricing ceases to be a major factor to any particular student. As a result of this ignorance, increased blanket institutional financial aid may be offered to many who would have enrolled at lower levels of aid. Thus, in order to attract an

incremental few, the institution may spend unnecessary financial aid dollars and not receive the level of new net tuition dollars that it could have received under a more limited financial aid policy.

Discounts in higher education carry an extended risk because they tend to be renewable for students whose academic performance continues to meet stated criteria. This means that when institutions expand their discount programs they will not feel the full financial impact for several years. It also means that when a four-year institution changes its mind it will need three years to close out its current commitments. This forces tuition to carry a surcharge each of those three years in order to pay for the entitlement demands on the unendowed financial aid commitments. A spiral of this type, once in place, is difficult to reverse.[2]

Martin Kramer describes the dilemma of establishing price and aid relationships as analogous to being caught in the strands of a spider's web. Most private colleges must make decisions about admissions standards, tuition levels, and financial aid awards simultaneously. In attempting to recruit a student body with a diversity of talents and backgrounds an institution may put demands on its aid system that it simply cannot meet. If not enough of the students are able to pay full tuition, more aid will be needed, yet aid resources will not be adequately funded

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[2]Richard A. Yanikowski, "Over a Barrel: The High Costs of Rising Tuitions," Educational Record 67, no.2/3 (Spring/Summer 1986): 14.

by the smaller net tuition revenues. If aid is overly generous, it drives the cost of tuition up further.[3]

Moreover, it may drive out diversity. If financial aid is not financed by external sources of revenue, a disproportionate burden of financing other students falls on middle and upper income families with children in college. As William W. Jellema stated, "The student aid deficit is, in considerable measure, a consequence of the response of private higher education to the needs of the disadvantaged. At the same time, many private institutions are not able to respond to the financial needs of the middle class, which has been their major constituency. The trend suggests that only the very rich or the very poor may be able to attend a private college or university."[4]

The recycling of tuition revenue into institutionally funded student financial aid programs has occurred throughout the independent sector -- small liberal arts colleges as well as comprehensive institutions and major research universities. These institutions have tried to use their own funds to offset the diminished strength of federal aid awards in order to continue to provide educational choice to those low and middle income students who could not otherwise afford to enroll in the independent sector. Since every reduction in federal aid is

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[3]Martin Kramer, "Caught in the Web-The Agenda of Enrollments, Costs, and Student Aid," Change 21, no. 2 (March/April 1989): 8.

[4]William W. Jellema, From Red to Black? (San Francisco, CA: Jossey-Bass Publishers, 1973), xi.

translated directly into a need for larger student aid expenditures by the institutions themselves, increases in institutionally funded aid may be responsible for as much as twenty-five percent of the increase in tuition at some institutions. As if that were not bad enough, according to one estimate, "Federal student grant programs would have to be virtually twice the level they are today to reach the same level of purchasing power they had in academic year 1980-81."[5]

Less selective institutions share the objectives of the more selective institutions but do not have the same applicant base or financial capacity to draw upon. They are often very hard-pressed financially and may have no excess demand for places in their entering class at current tuition levels. Simply maintaining current enrollment -- which may already be below the desired level -- can often be a major concern. Also, many potential applicants may be even more unable to cope with higher tuition charges than those currently enrolled.[6]

Effects of Student Aid on Enrollment as Seen in Other Studies

Although determining the cost effectiveness of financial aid is extremely important to institutional decision makers, the literature provides relatively little information regarding

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[5]Carol Frances, What Factors Affect College Tuition?: A Guide to the Facts and Issues (American Association of State Colleges and Universities, 1990), v.

[6]William G. Bowen, "The Student Aid-Tuition Nexus," Higher Education and National Affairs 36, no.10 (May 18, 1987): 6.

quantitative measurements of its effectiveness. Of the limited information available on price sensitivity, most of it is applicable to the public sector. These range from macroeconomic studies analyzing the potential national benefit of a change in federal aid policies to studies at the state and individual public institution level estimating the potential enrollment effect of a change in tuition rates (California, 1980, 1982, 1988; Illinois, 1980; Minnesota, 1985; South Carolina, 1978; Virginia, 1979, 1987; Georgetown University, 1981; Montgomery College, 1983; Murray State University, 1987).

Several prestigious private institutions have evaluated their financial aid policies to determine the effects on enrollment. Ronald G. Ehrenberg and Daniel R. Sherman conducted such a study at Cornell University[7] and Richard R. Spies of Princeton University performed a similar study of fifty-four selective institutions including his own.[8] Because of the competitive stature and relative price-demand inelasticity for such institutions, many factors besides tuition rates must be evaluated before such studies could be utilized by other dissimilar institutions.

Earlier studies include those that were analyses of the impact of increased federal aid programs on national enrollments

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[7]Ronald G. Ehrenberg and Daniel R. Sherman, "Optimal Financial Aid Policies for a Selective University" (National Bureau of Economic Research, 1982) Working paper no. 1014.

[8]Richard R. Spies, The Future of Private Colleges, The Effect of Rising Costs of College Choice (Princeton, N.J.: Princeton University, Industrial Relations Section, 1973).

(The Carnegie Council on Policy Studies, 1979, 1980; National Commission on the Financing of Postsecondary Education 1973, 1974; National Commission on Higher Education Issues, 1981). These studies were primarily directed at evaluating access and discerning the cost benefit of lowering tuition sufficiently to attract additional students who, based upon a lower cost, would pursue a college education. Several state university systems have conducted similar institutional studies in an attempt to estimate relationships between lower price and enrollment.

Although studies and discussions of the many issues surrounding this subject have been going on for years, the dynamics of the marketplace have changed dramatically, particularly in the less prestigious private institutions. Much of the earlier work in this area was conducted during periods of high demand and rapid growth in enrollment, high federal and state financial support, less sophisticated consumers, and a varying pattern of the number of applications submitted by each student. (In this regard, the fewer the number of applications submitted, the less explored are the alternatives and, therefore, the less informed is the eventual matriculation decision.[9])

At a seminar sponsored by the Policy Analysis Service of the American Council of Education in 1977, research was presented to the top federal policy makers by the leading researchers of the

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[9] Thomas M. Corwin and Laura Kent, eds., Tuition and Student Aid: Their Relation to College Enrollment Decisions (Washington, D.C.: American Council on Education, May 1978), 13, ERIC ED 154744.

time on the relationships among tuition, student aid, and the college-going decision. As might be expected, considerable disagreement occurred regarding the interaction of these factors. While some believed the relationships were infinite, George Weathersby, Graduate School of Education, Harvard University, observed that the affect of tuition and student financial aid on the decision to attend college was minimal. He stated that:

> "A student's college decisions (that is, whether to go and where to go) can usually be predicted from his or her personal characteristics. To put it another way: With a simple linear model--using the individual's socioeconomic background, high school record, college plans and aspirations, etc., as the independent variables but not including any information about institutional characteristics such as pricing or about student financial aid--85 percent of the college decisions made by high school seniors can be predicted with accuracy. All the more sophisticated models that are designed to aid institutions and government agencies in making better pricing decisions and that use a wider array of variables, including financial aid and institutional characteristics such as pricing and selectivity, are trying to account for the remaining 15 percent of high school seniors' decisions."[10]

Some of the other issues explored at this seminar included whether or not potential matriculants submitting only one application bias studies of this nature, whether higher levels of tuition with proportionately greater financial aid are more effective at influencing college attendance than low tuition, and whether the pre-selection implicit in the application to a particular type of institution complicates the generalizability

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[10]Corwin and Kent, eds., Tuition and Student Aid, 13-14.

of many studies.

In one of the most relevant studies, Gregory A. Jackson, a graduate student working with George Weathersby at Harvard, concluded that once the decision is made as to how expensive a college to attend, cost has no further consistent delineating affect on college choice. Cost influences where to apply rather than where to attend. This logic makes cost a neutral factor if the choices of where to apply are all similarly priced.

Jackson also reported that the fact of an award of aid to a potential student is more important than the amount.[11] He concluded that lowering tuition is not an efficient mechanism for achieving equal access and choice. Instead, tuition subsidies and student aid were found to be a more efficient use of financial resources.[12]

With specific reference to price elasticity and the sensitivity of net pricing, i.e., tuition less financial aid, much more needs to be done. This is particularly true for those private institutions where demand-response is not limited by available space. For those institutions, the net cost to a family may be the primary variable in deciding among substitute private institutions or between a private institution and its most similar public alternative. Two important studies of this

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[11]William D. Hyde Jr., The Effect of Tuition and Financial Aid on Access and Choice in Postsecondary Education, (Denver, CO: Education Commission of the States, Education Finance Center, January 1978) 44-45, ERIC ED 153541.

[12]Ibid, 22.

variable were conducted by James C. Hearn and David Longanecker in 1985[13] and Michael L. Tierney in 1981.[14]

Although research on the precise value of financial aid as a marketing and admissions tool is not extensive, the need for determining its true value is becoming more and more important. A 1986 study of over eleven hundred institutions showed that financial aid appears to be a conscious factor used by institutions -- particularly four-year ones -- in recruitment. More than half of the institutions overall reported an increase in the use of financial aid as a recruiting tool, with four year private institutions showing the most significant increase.[15]

Case Study of "The College"

In the fall semester of 1985, after decades of steady growth, the institution under study, a private Liberal Arts II college (hereinafter referred to as "The College"), that offers considerably more than half of its degrees in the professional fields, experienced its fourth straight year of significant decline in the number of entering students and reached the

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[13]James C. Hearn and David Longanecker, "Enrollment Effects of Alternative Postsecondary Pricing Policies," Journal of Higher Education 56, no. 5 (September/October 1985).

[14]Michael L. Tierney, "The Impact of Financial Aid on Student Demand for Public/Private Higher Education," Journal of Higher Education 51 (1981).

[15]H.M. Breland, G. Wilder, and N.J. Robertson, Demographics, Standards, and Equity: Challenges in College Admissions, (American Association of Collegiate Registrars and Admissions Officers, 1986) 63.

smallest number of new students in almost twenty years.

Although demographic projections had indicated gradually declining enrollments, particularly in the Northeast, changing college attendance patterns, especially for women, had succeeded in offsetting the shrinking pool of high school graduates for most institutions. In making comparisons with similar institutions, both locally and regionally, The College found that most others were experiencing steady or even slightly increasing enrollments of first time college students. The accelerating enrollment decline at The College appeared as something almost unique.

This situation caused considerable concern at all levels of the institution. Unfortunately, relatively little was known about why students selected The College and no quantitative techniques were in place to develop predictive models. Three college-wide task forces were established to evaluate the enrollment problem and to recommend strategies to ameliorate the situation. One of the main areas of study was the tuition and financial aid policies of The College. Studies of the applicant pools showed that The College was listed as the first choice by many of the financial aid applicants who eventually attended public institutions. This seemed to underscore a price sensitivity among The College's pool of potential matriculants.

The suggestion was quickly made that The College ought to respond to this price sensitivity by increasing student aid. Since the fundamental source of funds for financial aid was

tuition, this argument was countered by questioning the ethics of increasing tuition rates for all in order to benefit some. It was also argued that The College's tuition rate would rise disproportionate to other similar institutions and that its tuition gap with the state sector would increase. Since The College had long prided itself on trying to maintain a reasonable level of tuition for its traditional pool of lower and middle income families, this debate was extremely heated and the argument to alter The College's historic position was controversial and very difficult to sell. After much discussion, however, increasing the amount of financial aid became the most favored option and a wide variety of alternative pricing policies were proposed including both merit and need based aid programs.

Historically, approximately fifty percent of the student body received financial aid. The College's financial aid policy through 1984 had been to meet approximately sixty to seventy percent of a student's estimated financial need--that is, the costs remaining after consideration of the family contribution and the student's self-help earnings. This portion of estimated need was satisfied through a combination of loan, work-study, and grant money from federal, state, or institutional funds. The remaining balance had to be met by additional family contributions, the assumption of more debt, or further student employment.

In 1985, The College attempted to fine tune its existing financial aid packaging by increasing its average award to

approximately seventy-eight percent of estimated need with the more generous awards going to certain targeted groups of the financial aid applicant pool. The composition of the financial aid package was still very heavily weighted with loans rather than grants. This relatively minor change in financial aid policy had little effect on the matriculation rate of financial aid applicants and did not appear to stimulate more applications to The College.

One of the primary problems with using financial aid as an enrollment management tool is persuading prospective applicants that the advertised tuition price and the potential net price are significantly different and that they should apply for financial aid in order to assess accurately the affordability of The College. With only half of an applicant pool applying for financial aid, it seemed likely to college decision-makers that there was a larger group of potential matriculants in the market if the college could only find a way to demonstrate its affordability to them.

Therefore, to counter the pattern of declining enrollment and to improve its competitive position, The College decided to adopt a policy of meeting one hundred percent of a student's estimated need effective with the entering class of the fall 1986. There was considerable support for the belief that the publicity value of offering one hundred percent of estimated need would be at least as important as the actual implementation of the policy.

It is important to note that this policy resulted in giving additional financial aid to all who were qualified, including many who would have matriculated anyway with less generous financial aid packages, but who would now do so at a smaller net tuition to the institution.

There were three groups that the change in financial aid policy was intended to influence most:

(1) those truly needy students and their families who were interested in this institution, but simply could not afford to attend without additional financial assistance;

(2) those who were shopping in the marketplace, were interested in this type of institution, and were attracted by the financial aid policy of meeting one hundred percent of their estimated need; and

(3) those who do not have to depend upon financial aid, but are attracted to The College because someone they know is now either looking at or attending this institution --the so-called "coattail effect."

This last group of students may either not need financial aid or may already have some form of portable aid that they can take with them to the institution of their choice.

As the review of the literature revealed was often the case elsewhere, this decision to increase financial aid was made without any quantitative capability to predict its success or analyze its outcome. The drawing power of the institution was relatively unknown. Opinions, hyperbole, and allegedly well educated guesses were in abundance, but hard data did not exist. It was one of the easier decisions among the alternatives and, although tuition seemed to have been fairly priced, it did appear as though The College had fallen behind the market in its

financial aid strategy and net tuition pricing. The College always had a need-blind admissions policy--that is, not considering an applicant's financial need when deciding upon admission. This policy remained unaffected by the decision to meet one hundred percent of estimated need.

Institutional financial aid at The College is funded by gross revenues, primarily comprised of tuition and fees, which are enrollment driven. (Even at institutions where there are enough other revenues to fund existing financial aid through endowment or gift income, large increases in the cost of student aid would result in the need to reallocate existing resources unless the new financial aid policy generated enough new net revenues through increased enrollment to offset its cost.) Counting on increased enrollment, The College increase in tuition was moderate and consistent with similar institutions in the region so that the relative pricing position of The College was not adversely affected.

No other major policy change or significant event accompanied the change. There were no new programs or new facilities nor was there a change in advertising, admissions recruiting techniques or standards, or the number of high schools visited. There was a change in the Director of Admissions position in late fall 1985, but most of the existing programs were retained for the recruiting of the 1986 entering class with the primary emphasis being placed on a better "working" of the applicant pool and a new series of follow-up letters from The

College.

The rationale for selecting one institution for this study, rather than several, was to identify as specifically as possible the effect of one of the many variables (level of financial aid) that are known to influence college choice. The institution studied was faced with the same tuition-financial aid setting and public versus private tuition-gap problems that are typical of most independent institutions in the country, exclusive of the high demand, very selective institutions. The institution studied is co-educational, primarily undergraduate, and, although selective, not generally limited by capacity or other constraints in accepting its entering class.

Only entering students are reported on in this study because the change in financial aid policy was to be phased-in over a four year period. The one hundred percent financing of established need was to be applicable to entering students each year for four consecutive years and continued through their period of enrollment. Thus, it would take four years before the entire student body was being similarly treated. Also, the group of returning upperclassmen would be influenced by a broad range of other variables, in addition to price, and therefore were not included in this study.

The two groups of entering freshmen who were studied for comparative purposes were statistically very similar. The institution provided unrestricted (though coded) access to both applicant pools -- 1985 and 1986. While unknown factors in the

immediate setting or in the larger environment can confound a study such as this, The College was modifying only one variable: a significant change in its financial aid policy. There were, moreover, no evident contradictions to the assumption that the rest of the environment remained relatively constant from fall 1985 to fall 1986, so that the alternative enrollment choices were also relatively constant for each group of applicants.

By performing a multi-year study at the same institution, many of the institutional characteristics that are often identified in college choice literature as being significant determinants of an enrollment decision would be consistent for each group, each year. This fact then allowed other independent variables which would be unique to the student applicant to become more important than those unique to the institution. Thus the primary change in The College for the 1986 applicant group was in the form of an increased financial aid package.

Since this is a study of a single institution for two consecutive years, rather than a study of multiple institutions, there was no need to compensate for the problems that are caused by institutional differences. Issues related to institutional characteristics such as program mix, size, location, selectivity, faculty and institutional reputation, athletic program, employment opportunities, social activities and other similar variables remained constant and therefore resulted in a clearly focused study, unaffected by the complications presented by studies of multiple institutions.

This study sought to achieve the following objectives:

(1) to conduct a quantitative analysis to determine the similarity between two successive groups of entering freshmen with respect to the independent variables of sex, Scholastic Aptitude Test (SAT) scores, high school class rank, estimated financial need, amount awarded, and the percent of estimated need that was satisfied by the financial aid award;

(2) to generate a hypothesis about the effects of increased financial aid on the matriculation decision;

(3) to provide to other decision makers in the marketplace an illustration of the effect of additional financial aid on the matriculation decision that might assist them in formulating their future financial aid policies.

Research Questions - The following research questions were addressed in the study:

(1) As judged by the experience of one institution, to what extent does a change in financial aid strategy influence a potential matriculant's decision?

(2) To what extent are the independent variables of sex, Scholastic Aptitude Test (SAT) scores, high school class rank, estimated need, and amount awarded different for two successive groups of entering freshmen and to what extent does a change in the percentage of estimated need satisfied by the financial aid award influence a potential matriculant's decision?

The technique used to study the effect of this major change in financial aid policy on the matriculation decision of potential students was identified as Research Design 4 - "Randomized Control-Group Posttest Only Design" by Isaac and Michael.[16] (The same technique was identified earlier as

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[16]Stephen Isaac and William B. Michael, Handbook in Research and Evaluation, 2nd ed. (San Diego, CA: Edits publishers, 1981), 69.

Research Design 6 - "Experimental and Quasi-Experimental Designs for Research" by Campbell and Stanley.[17]) In this type of study a control group is identified and treated in a manner that is different from that which is applied to the experimental group.

The control group was the 1985 admitted applicant pool to The College, while the experimental group was the 1986 admitted applicant pool. The 1985 group was treated marginally better than those of preceding years in regard to the extent and composition of their financial aid awards, that is, they did not receive full funding of their estimated need, but they did receive awards averaging approximately seventy-eight percent of their estimated need. The 1986 experimental group received significantly higher levels of financial aid across the board and generally had one hundred percent or more of their estimated need satisfied by their financial aid award. Also, the increased level of the 1986 financial aid awards was almost exclusively in the form of institutional grants.

Homogeneity of All Accepted Applicants

In order to demonstrate the homogeneity between the two groups of accepted applicants without a pre-test, an analysis of the independent variables of each group was performed. T-tests were used because of their capability in computing the probability levels of whether or not the difference between two

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[17]Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-Experimental Designs for Research (Boston, MA: Houghton Mifflin Co., 1963), 25.

means is significant. These tests were evaluated to determine if significant differences existed between the means of each group for the independent variables of sex, Scholastic Aptitude Test (SAT) scores, and high school class rank. (See Table 1)

Table 1

Independent Variables	T-test Statistic	P
1. Sex	.990	NS
2. Combined SAT scores	.030	NS
3. High school class rank	.258	NS

It can be noted that there was no significant difference between the percent distribution of males and females from one year to the next. This statistic failed to approach the .01 level of significance specified as a criterion for testing the homogeneity of the total pool of accepted applicants. Similar results can be noted for the variables Scholastic Aptitude Test score and high school class rank where the probabilities of .03 and .258 respectfully, also failed to reach the .01 level of significance.

Homogeneity of the Study Group

The study group was then defined as those accepted applicants who had applied for financial aid, had an estimated need, and subsequently received a financial aid award. This group represented individuals who would be affected by the more generous financial aid policy. T-tests were again used to

determine the homogeneity of members of the study group for each year in regard to the independent variables of sex, combined Scholastic Aptitude Test score, high school class rank, estimated need, and amount awarded. (See Table 2)

Table 2

Independent Variables	T-test Statistic	P
1. Sex	.257	NS
2. Combined SAT Scores	.412	NS
3. High School Class Rank	.072	NS
4. Estimated Need	.674	NS
5. Amount Awarded	.000	*

* P<.01

These T-tests demonstrated that the study groups for each year were also similar in composition using a .01 level of significance, with the exception of the amount awarded.

Effect of Aid on Matriculation

An analysis of the accepted applicants for each year and their matriculation rates is shown in Table 3.

Table 3

Analysis of the Matriculation Rates of Accepted Applicants to "The College" for Fall 1985 & Fall 1986

	Fall 1985			Fall 1986		
	Accepted Applicants	Number that Matriculated	%	Accepted Applicants	Number that Matriculated	%
Total	1637	576	35	1638	710	43
Less: Accepted applicants who did not apply for aid	969	205	21	894	233	26
Accepted applicants who did apply for aid	668	371	56	744	477	64
Less: Accepted applicants who applied for aid and either did not demonstrate a financial need or did not receive an award	173	99	57	208	116	56
Study Group: Accepted applicants who applied for aid, had a need and received an award	495	272	55	536	361	67

The aid-treated group of each applicant pool (those who received a financial aid award) was then analyzed to assess whether or not the amount of aid was a significant determinant of matriculation. Chi-square analysis was performed to determine further the nature of the group differences with respect to the interaction of the financial aid treatment and the matriculation decision.

Chi-Square tests of the proportions of the number of matriculants by percentage of financial need met each year, by

the degree of estimated need, and by the amount awarded were then used to test the significance of the effect of treating the experimental group with significantly higher amounts of financial aid than the control group. The treatment consisted of awarding this group an average of ninety-eight percent of demonstrated financial aid versus awards averaging seventy-eight percent of demonstrated need for the control group.

Of the study group matriculants, 272 out of 495 representing 54.9% of the accepted applicant pool received some form of institutionally administered aid in 1985, while 361 out of 536 representing 67.4% received financial aid in 1986. Chi-square analysis was then applied to the rate of matriculation by the percentage of estimated need satisfied by the financial aid award each year. The Chi-square statistic for this comparison was .3143 in 1985 and .0000 in 1986. Using a significance level of .05, these results demonstrated that there appears to be no systematic relationship between these variables in 1985, yet there appears to be a strong relationship in 1986. The combination of increases in award sum and percent of estimated need satisfied for two similar pools of applicants resulted in a significant change in the rate of matriculation.

The increase in the average financial aid award for 1986 allowed The College to meet and often exceed the estimated need of most members of the study group. For the students and their families, this new financial aid policy allowed The College to close the gap in remaining unmet need to a point that made

matriculation at The College a financially feasible alternative, whereas without such a change it appeared that this was becoming less and less of a choice. With the cost factor neutralized by financial aid, a favorable matriculation decision was at least possible. This theory is supported by the significantly higher matriculation rates in 1986 for those high-need, high-award recipients.

Despite this dramatic increase in institutional financial aid, the new policy did not affect the financial situation of The College in an adverse way. The net effect on the budget of the institution was not adverse, no deficits were incurred, and no deferred maintenance was apparent.

Conclusion

The rapidly rising cost of higher education and the reluctance or inability of many families to bear the increased cost has created a need for institutions to be more keenly aware of the price sensitivity of their product. This steeper charge for higher education could lead more students to make their institutional choice solely on the basis of price. The apparent unwillingness of parents to sacrifice in order to finance higher education for their children has become a major area of concern.

In recent years the savings rate for families has declined precipitously. Longer range, society could do more to encourage parents to save for their children's college costs by developing tax incentives for increased parental savings. More immediately

however, the overall inadequacy of financial aid has had a dramatic effect on the pool of potential college students, the quality of higher education that can be provided, the financial stability of many poorly endowed independent institutions, and has even dimmed the future of a diverse, strong, and balanced system of higher education opportunities.

The significance of this study purports to be its contribution to substantive theory about the price elasticity of tuition as it relates to the strategic use of financial aid. It may provide decision makers in the private sector of higher education with a basis for studying their own institutions and making strategic decisions regarding their net revenue, i.e., that revenue from tuition and fees remaining after financial aid has been deducted. While it is popularly assumed that enough money will resolve virtually any problem, there is very little in the literature or documented theory concerning the point at which the enrollment benefits due to financial aid are optimized.

Other products and industries have much better knowledge of their point of price resistance than does higher education. The same principles that are taught in institutions of higher education are often not applied in their own management. Previous research has indicated that individual institutions have tried to determine a price elasticity that is unique to their particular circumstances. Each institution needs to develop its own strategic objective(s) for financial aid in order to predict more accurately and to influence student choice more effectively.

The management and control of such a major part of an institution's budget is much more than an exercise in adherence to bureaucratic regulations.

If price sensitivity overwhelmingly dictates college choice decisions, many independent institutions without intervention will have difficulty in attracting and retaining their historic share of the eighteen year old cohort. This problem is compounded by the fact that in the nineties a larger percentage of this cohort will be in the minority sector, a group that has been less affluent and more price sensitive. As it is now, many independent institutions already face significant student aid burdens as they try to maintain diverse student bodies.

The stated tuition price of a college may be a quick deterrent to many prospective applicants, but it has practically no economic meaning for most students because it represents neither what they will actually pay nor the cost of the education that they will receive. The practice of discounting the stated price has become so prevalent that fewer and fewer students pay the tuition sticker price, and, except at the most tuition dependent institutions, none pays the full cost of this education.

One of the major problems with establishing a policy of meeting one hundred percent of financial need is that in order to attract the incremental students that would only attend an institution if a higher level of financial aid were offered, the institution has to meet the full need of all aid applicants, even

though many may not have required such a high level of aid award. The increased cost of financial aid under this policy requires that a new or reallocated source of revenue be found.

To fund these higher costs, an institution must draw down on its endowments, redirect its fund raising efforts, short change its staff and defer its maintenance, or, as a worst but very realistic alternative for many smaller colleges, become trapped in an escalating spiral of higher and higher levels of tuition increases which will further exacerbate the institutions' financial vulnerability. As institutions become caught in this spiral, less and less of the gross tuition dollar is available as a contribution to cover fixed costs, while at the same time other variable costs are also being incurred for each new student.

Ideally, the incremental revenue from higher levels of enrollment would be the intended solution. However, the risk is high. The failure of this policy change to increase total enrollments could be disastrous. The institution under study here was fortunate: increased enrollment has more than covered the increased cost of student aid. And even now, in fall 1991, the desired outcome continues. But such a policy is also much easier to establish than to undo or change. Students that enroll with the promise of specific levels of financial aid will expect such levels of aid to continue for the duration of their four years.

This study was conducted during a period of relative stability in other institutional variables and therefore afforded

the opportunity to analyze the results of a net pricing policy decision. The composition of each individual financial aid package is an important strategic decision, and a better understanding of the effect that financial aid has on the matriculation decision is of primary importance to higher education administrators. In other institutions, however, confounding institutional variables may be more turbulent, making both the decision and the analysis more difficult.

In recent years institutions have had to assume a greater burden in providing student financial aid by augmenting shrinking state and federal tuition aid with their own funds, funds that were previously used for other purposes. For less selective and less well-financed institutions, with no excess demand for places in their classes, reductions in external student aid have reduced needy students' access. While at the same time, to paraphrase the title of a 1973 book on the financial status of private colleges and universities entitled From Red to Black?,[18] these adverse factors have continued to erode the financial viability of these institutions to the point that many have shifted from "red to black and back" and are now faced with a severe threat to their continued survival.

Given the many demographic and economic problems that are present in the current external environment, it is increasingly important for institutions to understand and seek to influence the college choice implications of price for their specific

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[18]Jellema, From Red to Black?.

market segment. Out of the more than 3,500 institutions of higher education in the United States, there are only a handful of schools whose demand is relatively insensitive to price. For the rest of higher education, the marketing axiom of "know thy market" certainly should include the issues of price sensitivity and net pricing. The strategic use of financial aid is vital in order for institutions to make appropriate tuition and net price decisions.

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